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10/656,280	09/08/2003	Tatsuya Niimi	242548US2	7137
22850	7590	06/26/2009		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER DOTE, JANIS L	
			ART UNIT 1795	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/656,280

**Applicant(s)**

NIIMI ET AL.

**Examiner**

Janis L. Dote

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 4-15, 21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 4-15, 21 and 22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

1. The examiner acknowledges the amendment to claim 1, the cancellation of claims 2 and 3, and the addition of claim 22 filed on Feb. 26, 2009. Claims 1, 4-15, 21, and 22 are pending.

2. Applicants' election without traverse of the invention of Group I, claims 1, 4-15, and added claims 21 and 22, in the reply filed on Nov. 14, 2005, is acknowledged.

3. The rejection of claims 1-15 and 21 under 35 U.S.C. 112, second paragraph, set forth in the office action mailed on Nov. 26, 2008, paragraph 7, has been withdrawn in response to applicants comments that "the phrase 'within a range of 7.3° to 9.4°' means between 7.3° to 9.4°" (emphasis added), i.e., excluding the end-values.

The rejection of claims 1, 2, and 4-15 under 35 U.S.C. 112, first paragraph, set forth in the office action mailed on Nov. 26, 2008, paragraph 9, item (2), has been withdrawn in response to the amendment to claim 1 filed on Feb. 26, 2009.

The objection to claim 2 set forth in the office action mailed on Nov. 26, 2008, paragraph 10, has been mooted by the cancellation of claim 2 filed on Feb. 26, 2009.

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4. The examiner notes that the instant specification at page 20, lines 13-18, defines the term "proximal charging system charging member" recited in instant claim 12 as "a charging member which is not brought into contact with but proximal to the surface of the photoconductor so as to have a gap of 200  $\mu\text{m}$  or less between the surface of a photoconductor and the surface of the charging member."

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1, 4-15, and 21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant arts that the inventor(s), at the time the application was filed, had possession of the claimed invention.

(1) Instant claims 1 and 21 and claims 4-15, which depend on claim 1, recite that the "titanyl phthalocyanine crystals

having, as a diffraction peak ( $\pm 0.2^\circ$ ) of Bragg angle  $2\theta$ . . . main peaks at  $9.4^\circ$ . . . and a peak at  $7.3^\circ$  as a diffraction peak on the lowest angle side, and not having a peak within a range of from  $7.3^\circ$  to  $9.4^\circ$ " (emphasis added).

The originally filed specification does not provide an adequate written description of the recited titanyl phthalocyanine crystal diffraction peaks. The originally filed specification describes "titanyl phthalocyanine crystals having, as a diffraction peak ( $\pm 0.2^\circ$ ) of Bragg angle  $2\theta$ . . . main peaks at " $9.4^\circ$ . . . and a peak at  $7.3^\circ$  as a diffraction peak on the lowest angle side, and not having a peak within a range of from  $7.4^\circ$  to  $9.3^\circ$ ", not from  $7.3^\circ$  to  $9.4^\circ$  as recited in instant claims 1 and 21. See the originally filed specification at page 12, line 16, page 19, line 15, page 40, lines 12-13, and page 44, line 25, to page 45, line 1. The limitation "not having a peak within a range of from  $7.3^\circ$  to  $9.4^\circ$ " is broader than the originally described limitation of "not having a peak within a range of from  $7.4^\circ$  to  $9.3^\circ$ " because it further excludes peaks between  $7.3$  to  $7.4^\circ$  and between  $9.3$  and  $9.4^\circ$ . Applicants' indication of support in the originally filed specification set forth in the response filed on Feb. 26, 2009, is not persuasive for the reasons given infra.

(2) Instant claim 21 further recites that the titanyl phthalocyanine crystals are "obtained by subjecting amorphous or low crystallinity titanyl phthalocyanine . . . to crystal conversion with an organic solvent in the presence of water and then separating titanyl phthalocyanine having undergone crystal conversion from the organic solvent through filtration before it grows to an average particle diameter of primary particles more than 0.3  $\mu\text{m}$ ."

The originally filed specification does not provide an adequate written description of obtaining titanyl phthalocyanine crystals by the process recited in instant claim 21. The originally filed specification at page 12, lines 19-20, describes titanyl phthalocyanine crystals preferably having an average primary particle diameter less than 0.3  $\mu\text{m}$ . The originally filed specification at page 45, lines 2-6, further describes obtaining titanyl phthalocyanine by "without drying the . . . amorphous titanyl phthalocyanine (low crystallinity titanyl phthalocyanine) [an aqueous paste of amorphous titanyl phthalocyanine], mixing and stirring it with an organic solvent in the presence of water." The originally filed specification previously describes forming an aqueous paste of the amorphous titanyl phthalocyanine having a solid concentration of from about 5% by weight to 15% by weight. See the originally filed

specification at page 43, line 15, to page 44, line 14. The crystal conversion process recited in instant claim 21 is broader than the originally described process because it does not require the amorphous titanyl phthalocyanine to be in an aqueous paste as described in the originally filed specification.

Moreover, the originally filed specification at page 48, lines 3-25, discloses that "the crystal particle diameter has a proportional relation with crystal conversion time . . . so that it is also effective to terminate the reaction as soon as completion of a predetermined reaction (crystal conversion). The reaction is terminated by the addition of a large amount of a solvent in which crystal conversion does not occur smoothly as soon as the crystal conversion is completed . . . The crystal conversion can be terminated by adding 10 times the amount of such a solvent relative to the solvent used for crystal conversion. By adopting such a crystal conversion method, the primary particle size of titanyl phthalocyanine crystals can be reduced (less than 0.3  $\mu\text{m}$  . . . The titanyl phthalocyanines are filtered just after crystal conversion and separated from the solvent for crystal conversion." Thus, the originally filed specification does not appear to describe filtering the titanyl phthalocyanine having undergone crystal conversion "before it

grows to an average particle diameter of more than 0.3  $\mu\text{m}$ ," as recited in instant claim 21. Nor does the originally filed specification describe obtaining titanyl phthalocyanine crystals having an average primary particle size of 0.3  $\mu\text{m}$  or less by the method recited in instant claim 21.

Applicants' arguments filed on Feb. 26, 2009, have been fully considered but they are not persuasive.

Regarding the rejection in item (1) above, applicants assert that instant Synthesis Example 1, Figure 9, and Table 1 show "no peaks within the range of from 7.3° to 9.4°, i.e., between the peaks at 7.3° and 9.4°." Applicants' assert that the specification provides support for the upper limit, 9.4°, of the range at pages 44-45, which teaches the conversion of amorphous titanyl phthalocyanine to titanyl phthalocyanine crystals "having neither a peak within a range from 7.4° to 9.4°" (emphasis added in the original).

Applicants' assertions are not persuasive. The originally filed specification in Synthesis Example 1 at page 85, lines 13-14, and in Table 1 reports that the X-ray diffraction spectrum of the titanyl phthalocyanine (TiOPc) crystal powder made in Synthesis Example 1 "did not have a peak within a range of 7.4 to 9.3°," not the "range of 7.3° to 9.4°" recited in instant claims 1 and 21. Synthesis Example 1 therefore does not



provide an adequate written description for either the upper or the lower range limit recitations in instant claims 1 and 21. Furthermore, the particular X-ray spectrum shown in Figure 9 only characterizes the crystal structure of the particular TiOPc crystal powder made in Synthesis Example 1. Therefore, Figure 9, which shows the diffraction pattern for Synthesis Example 1, does not provide an adequate written description for the recited range either.

Furthermore, the TiOPc crystals described in the paragraph bridging pages 44 and 45 are obtained by converting the particular amorphous TiOPc described at page 43, line 8, to page 44, line 14, "without drying the above-described amorphous titanyl phthalocyanine (low crystallinity titanyl phthalocyanine), mixing and stirring with an organic solvent in the presence of water." See the originally filed specification, page 45, lines 2-6. Instant claim 1 does not require that the TiOPc crystals be obtained by using the particular amorphous TiOPc described at page 43, line 8, to page 44, line 14, of the originally filed specification by the particular crystal conversion described in the originally filed specification at page 45, lines 2-6. For the reasons discussed in item (2) above, instant claim 21 also does not recite that the TiOPc crystals are obtained by the particular crystal conversion

described in the originally filed specification. Thus, based on the evidence in the originally filed specification, the originally filed specification does not provide an adequate written description of the TiOPc crystals having the broadly recited X-ray diffraction spectrum having "no peaks within the range of  $7.3^{\circ}$  to  $9.4^{\circ}$ " recited in instant claims 1 and 21. Accordingly, the rejection of claims 1, 4-15, and 21 stand.

Regarding the rejection in item (2) above, applicants assert that the office has not satisfied its "initial burden to establish that the elements of the method missing from the claimed invention [in claim 21] are essential or necessary to the invention Applicant claims. Mere allegations that Applicant's claims are not described in the manner described in the supporting Specification without evidence are not sufficient to sustain" the rejection under 35 U.S.C. 112, first paragraph.

Applicants' assertions are not persuasive. First, the originally filed specification does not appear to describe any of the steps in the conversion process as non-essential or not necessary. Nor have applicants indicated where the originally filed specification teaches that those process steps or elements missing from the process recited in instant claim 21 are not essential or critical features of applicants' invention. Second, the rejection set forth in item (2) cites specific page

and line numbers to show there is not an adequate written description of the product-by-process limitation recited in instant claim 21. See the rejection in item (2), above, and in office action mailed on Nov. 26, 2008, paragraph 9, item (2), pages 6-10. Furthermore, applicants have not indicated where the originally filed specification provides an adequate written description of filtering the TiOPc having undergone crystal conversion "before it grows to an average particle diameter of more than 0.3  $\mu\text{m}$ ," as recited in instant claim 21.

Accordingly, the rejection of claim 21 stands.

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. US 2003/0104295 (Niimi'295) has an effective US filing date of Mar. 22, 2002, and was published on Jun. 5, 2003. Both dates are prior to the US filing date, Sep. 8, 2003, of the instant specification. Thus, Niimi'295 qualifies as prior art under 35 U.S.C. 102(a), as well as under 35 U.S.C. 102(e). Accordingly, Niimi'295 qualifies as prior art under 35 U.S.C. 103(c).

9. Claims 1, 4-15, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niimi'295, as evidenced by applicants' admissions at page 3, line 10, to page 4, line 10 (applicants' admission 2), Japanese Patent 2000-319538 (JP'538), as evidenced by Ladd et al., Structure Determination by X-ray Diffraction, p. 426 (Ladd), combined with US 5,776,650 (Hashimoto) and US 2001/0022343 (Sakai). See the USPTO English-language translation of JP'538 for cites.

Niimi'295 discloses an image forming apparatus and a process cartridge. The image forming apparatus comprises a photoreceptor **6**, a charger **8**, a light irradiator **10**, an image developer **11**, and a transfer device **15**. Fig. 5 and paragraphs 0115, 0116, and 0122. Niimi'295 further teaches an image forming apparatus comprising a plurality of image forming units, each comprising a photoreceptor, a charger, a light irradiator, an image developer, and a transfer device. Fig. 10 and paragraphs 0127-0128. Niimi'295 also teaches a process cartridge that comprises a photoreceptor with a charger, an image irradiator, an image developer, and a cleaner. Fig. 7 and paragraph 0126. Niimi'295 teaches that the charger can be a contact charging system, such as a contact charging roller, as recited in instant claim 11, or a non-contact proximal charging system as recited in instant claims 12 and 13.

Paragraphs 0117-0118. Niimi'295 also teaches that an alternating superimposed voltage can be applied to the charger, which meets the charger limitation recited in instant claim 14. Paragraph 0119.

Niimi'295 exemplifies a photoreceptor comprising a conductive support, a charge generation layer, a charge transport layer disposed on the charge generation layer, and three protective layers. See example 14 at pages 24-26. All three protective layers comprise  $\alpha$ -alumina fine particles having a resistivity of  $2.5 \times 10^{12} \Omega \cdot \text{cm}$ , which meets the protective layer limitations recited in instant claims 5 and 6. Niimi'295 further discloses that the three protective layers can comprise a charge transferring polycarbonate having a side-chain comprising a triarylamine structure; and that they are formed using non-halogen solvents such as tetrahydrofuran and cyclohexanone. See example 7 at pages 21-22, and example 14. Because the first and second protective layers comprise the charge transferring polycarbonate, the layers are characterizable as charge transport layers and therefore meet the charge transport layer limitations recited in instant claims 4, 7, and 8. Niimi'295 also teaches that the conductive support can be an anodized surface as recited in instant claim 9. Paragraphs 0047-0048. The charge generation layer

comprises titanyl phthalocyanine crystals dispersed in a polyvinylbutyral binder resin. The titanyl phthalocyanine crystals exhibit an X-ray diffraction pattern having a maximum peak at a Bragg angle of  $27.2^{\circ}$ , a lowest peak at  $7.3^{\circ}$ , peaks at  $9.4^{\circ}$ ,  $9.6^{\circ}$ , and  $24^{\circ}$ , no peaks between  $7.3^{\circ}$  and  $9.4^{\circ}$ , and no peak at  $26.3^{\circ}$ . See Fig. 8. The locations of the peaks at angles  $7.3^{\circ}$ ,  $9.4^{\circ}$ ,  $9.6^{\circ}$ ,  $24^{\circ}$ , and  $27.2^{\circ}$  were determined by interpolating the positions on the x-axis scale in Fig. 8. The X-ray diffraction pattern meets the peak location limitations recited in instant claims 1, 21, and 22.

Niimi'295 does not disclose that the X-ray diffraction was obtained with the Cu-K $\alpha$  wavelength of 1.542 Å. However, as discussed above, the Niimi'295 X-ray diffraction pattern meets the peak location limitations recited in instant claims 1, 21, and 22. Accordingly, it is reasonable to presume that the X-ray diffraction pattern disclosed in Niimi'295 was determined with Cu-K $\alpha$  X-ray radiation having a wavelength of 1.542 Å as recited in the instant claims. The burden is on applicants to prove otherwise. In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

Niimi'295 does not exemplify the use of titanyl phthalocyanine crystals having an average particle diameter as recited in instant claims 1, 21, and 22. However, as discussed supra, the Niimi'295 charge generation layer comprises titanyl

phthalocyanine crystals dispersed in a polyvinylbutyral binder resin, where the titanyl phthalocyanine crystals exhibit an X-ray diffraction pattern having a maximum peak at a Bragg angle of  $27.2^{\circ}$ . Niimi'295 teaches that the charge generation layer is prepared by mixing the charge generation material with a suitable solvent and binder resin and dispersing the mixture with "a ball mill . . .". Paragraph 0058.

Hashimoto teaches a method of preparing a charge generation dispersion liquid for forming a charge generation layer comprising the step of dispersing a charge generation pigment or dye and a binder resin with a "ball-shaped pulverizing media" in a dispersing solvent to an average particle size of about 0.1 to 0.3  $\mu\text{m}$ . Col. 2, lines 52-68. Hashimoto exemplifies forming charge generation layers with said charge generation dispersion liquid where the average particle size of the organic pigment or dye dispersoids is either 0.15  $\mu\text{m}$  or 0.18  $\mu\text{m}$ . See the first and second embodiments at col. 6, line 33-64, and col. 7, lines 26-30, respectively, and in Table 1 at col. 8. The average particle sizes of about 0.1 to 0.3  $\mu\text{m}$ , e.g., 0.15  $\mu\text{m}$  or 0.18  $\mu\text{m}$ , are within the particle diameter limitations of less than 0.3  $\mu\text{m}$  recited in instant claims 1 and 22 and of 0.3  $\mu\text{m}$  or less recited in instant claim 21, respectively. Hashimoto teaches that the charge generation pigments or dyes "are not

specifically limited as far as the pigments or the dyes may function as a charge generating agent in a charge generation layer. For example, pigments such as phthalocyanine pigments . . .” Col. 4, lines 45-50. According to Hashimoto, when the organic pigment or dye is dispersed in a resin binder as taught by Hashimoto to an average particle size of about 0.1 to 0.3  $\mu\text{m}$ , the “pigment or dye dispersoids are prevented from coagulating for a time period long enough to cause no problems in practical use of the dispersion liquid.” Col. 4, lines 20-28. Hashimoto teaches that its dispersion liquid “exhibits excellent stability of the pigment or dye dispersoids, facilitates manufacturing electro-photographic photoconductors having a charge generation layer which exhibits excellent photographic properties.” Col. 4, lines 29-33. The photoconductor also has improved stability. Col. 2, lines 41-43.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Niimi’295 and Hashimoto, to prepare a charge generation dispersion coating solution comprising the Niimi’295 titanyl phthalocyanine and polyvinylbutyral resin used in the exemplified charge generation layer in example 14 of Niimi’295, as taught by Hashimoto, such that the resultant dispersion solution comprises titanyl phthalocyanine pigment dispersoids having an average particle



size of about 0.1 to 0.3  $\mu\text{m}$ , e.g., 0.15  $\mu\text{m}$  or 0.18  $\mu\text{m}$ , and to use the resultant dispersion solution to form the charge generation layer in the photoreceptor disclosed by Niimi'295. That person would have had a reasonable expectation of successfully obtaining an image forming apparatus that has improved stability and excellent photoconductive properties as taught by Hashimoto.

Instant claims 1 and 22 are written in product-by-process format. The combined teachings of Niimi'295 and Hashimoto do not disclose that the charge generation layer is formed by the method recited in the instant claims 1 and 22. However, as discussed above, the combined teachings of Niimi'295 and Hashimoto render obvious a titanyl phthalocyanine having an average particle size of about 0.1 to 0.3  $\mu\text{m}$ , e.g., 0.15  $\mu\text{m}$  or 0.18  $\mu\text{m}$ . The average particle sizes of 0.15 or 0.18  $\mu\text{m}$  meet the average particle size limitation of less than 0.3  $\mu\text{m}$  recited in instant claims 1 and 22. Thus, it appears that the charge generation layer rendered obvious over the combined teachings of Niimi'295 and Hashimoto is the same or substantially the same as the instantly recited charge generation layer made by the process recited in instant claims 1 and 22. The burden is on applicants to prove otherwise. In re Marosi, 218 USPQ 289 (Fed.

Cir. 1983); In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985);  
MPEP 2113.

Instant claim 21 is written in product-by-process format. Niimi'295 does not disclose that its titanyl phthalocyanine is obtained by the method recited in instant claim 21. However, the Niimi'295 titanyl phthalocyanine exhibits an X-ray diffraction spectrum that meets the spectrum recited in instant claim 21. The titanyl phthalocyanine average particle size of 0.15  $\mu\text{m}$  or 0.18  $\mu\text{m}$ , which is rendered obvious over the combined teachings of Niimi'295 and Hashimoto, meets the particle size limitation of 0.3  $\mu\text{m}$  or less recited in instant claim 21. Therefore, it appears that the titanyl phthalocyanine rendered obvious over the combined teachings of Niimi'633 and Hashimoto is the same or substantially the same as the instantly recited titanyl phthalocyanine crystals made by the process steps recited in the instant claim. The burden is on applicants to prove otherwise. Marosi; Thorpe; MPEP 2113.

Niimi'295 does not disclose that its light irradiator is "configured to irradiate a white light having a resolution of 600 dpi or greater" as recited in instant claims 1, 21, and 22.

Sakai discloses a multi-beam scanning device to imagewise irradiate the charged photoconductor to form a latent electrostatic latent image. The multi-beam scanning device

comprises a semiconductor laser (i.e., a laser diode) array **112** and a rotary polygonal mirror **152**. Fig. 6, paragraph 0131. The writing density of the multi-beam scanning device is 1200 dpi and the laser beam has a beam spot diameter of 30  $\mu\text{m}$ .

Paragraph 0137. The writing density of 1200 dpi meets the resolution limitations recited in instant claims 1, 21, and 22. According to Sakai, the multi-beam scanning device "effectively reduces the variations of the beam spots on the scanned surface to a smallest possible level so that the multi-beam scanning is carried out with accurate beam spot diameter so as to create good quality reproduced image." Sakai discloses that in conventional multi-beam scanning devices, the divergence angle of the laser beams emitted by the semiconductor laser array is liable to variations that cause the degradation of the quality of a reproduced image. Paragraph 0009.

It would have been obvious for a person having ordinary skill in the art to use the Sakai multi-beam scanning device as the light irradiator in the apparatus or the process cartridge rendered obvious over the combined teachings of Niimi'295 and Hashimoto. That person would have had a reasonable expectation of successfully obtaining an image forming apparatus and a process cartridge that provide good quality reproduced images having a resolution of 1200 dpi.

The cited prior art does not expressly describe an image developer "configured to" develop a latent electrostatic image formed on the surface of the photoreceptor within 200 msec after the surface of the photoreceptor is exposed by the light irradiator as recited in instant claims 1 and 22. Nor does cited prior art expressly describe a light irradiator "configured to" irradiate a write light on the surface of the photoreceptor with an exposure energy of 5 erg/cm<sup>2</sup> or less as recited in instant claims 1, 21, and 22.

However, said recitations are merely functional language describing how the apparatus functions. For the reasons discussed supra, the apparatuses and process cartridge rendered obvious over the combined teachings of the prior art meet all of the structural and compositional limitations recited in the instant claims. "Claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function." See MPEP 2114 and cases cited therein. "A claim containing a 'recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus' if the prior art apparatus teaches all the structural limitations of the claim." MPEP 2114, citing Ex parte Masham, 2 USPQ2d 1647 (BPAI 1987).

The functional recitations do not distinguish the structural elements in the instantly claimed apparatus and process cartridge from those in the apparatuses and process cartridge rendered obvious over the cited prior art.

Furthermore, according to Niimi'295, by using its image forming apparatuses and process cartridge, "high speed printing is possible . . . high qualities images can be formed steadily even after repeated use." Paragraph 0023. According to the instant specification, the characteristic time in known speedup monochrome electrophotographic apparatuses from a "writing portion," i.e., exposure from the light irradiator in the apparatus, to a "development portion," i.e., development of the latent image with a toner, is "about 200 msec at the longest." See the instant specification, the paragraph bridging pages 3 and 4. Thus, the time between exposure and development of "within 200 msec" recited in instant claims 1 and 22 appears to be characteristic of the state of the art as of the filing date of the instant application. The instant specification further discloses that in tandem full-color electrophotographic apparatuses, where the photoconductors have a diameter of 30  $\mu\text{m}$  and the copying speed reaches 30 sheets/min or greater, "the time between exposure and development can be set only equal to or less than that of the monochrome electrophotographic

apparatus." Page 4, lines 2-10. Thus, a person having ordinary skill in the art would have reasonably expected that the time from exposure to development in speedup image forming apparatuses based on the state of the art, such as those taught by Niimi'295, is at most 200 msec.

Moreover, as discussed above, the combined teachings of Niimi'295 and Hashimoto render obvious a photoreceptor that meets all the structural and compositional limitations recited in the instant claims. Furthermore, example 14 of Niimi'295 uses a semiconductor laser of 780 nm as the light source for image exposure. JP'538 exemplifies a photoreceptor comprising a charge generation layer comprising titanyl phthalocyanine crystals that exhibit an X-ray diffraction pattern that is similar to that of the Niimi'295 titanyl phthalocyanine crystals and that meets the peak locations recited in instant claims 1, 21, and 22. The JP'538 X-ray diffraction pattern has a maximum peak at a Bragg angle of  $27.2^{\circ} \pm 0.2^{\circ}$  and a lowest peak at an angle of  $7.3^{\circ}$ , when a specific X-ray of Cu-K $\alpha$  having a wavelength of 1.514 Å irradiates the titanyl phthalocyanine pigment. Translation, paragraph 0012, and example 1 in paragraphs 0047-0052 and in Table 1, and Fig. 5. JP'538 teaches that there are no peaks between Bragg angles  $7.4^{\circ}$  and  $9.4^{\circ}$ . Translation, paragraph 0012. The interval between the peaks

meets the limitation of "not having a peak within the range of from 7.4 to 9.3°" recited in instant claim 22 and is within the limitation of "not having a peak within the range of 7.3 to 9.4°" recited in instant claims 1 and 21. The diffraction spectrum further has a peak at 9.5°, a peak at 9.7°, a peak at 24°, and no peak at 26.3°. See Fig. 5. The peaks at 27.2°, 7.3°, 9.5°, 9.7°, and 24°, and no peak at 26.3° meet the limitations in the "X-ray diffraction spectrum" recited in instant claims 1, 21, and 22. The locations of the peaks at angles 9.5°, 9.7°, and 24° were determined by interpolating the positions on the x-axis in Fig. 5. (The JP'538 reported wavelength of 1.514 Å appears to be a typographical error. The "Cu-K $\alpha$  wavelength" of 1.514 Å does not appear to exist. It is well known that the Cu-K $\alpha$  spectra line is a doublet consisting of  $\alpha_1$  ( $\lambda = 1.5405$ ) and  $\alpha_2$  ( $\lambda = 1.5443$ ). The weighted mean K $\alpha$  line is 1.542 Å, which is the value normally used in Cu-K $\alpha$  X-ray diffraction. See Ladd, p. 426. Accordingly, because JP'538 teaches using the X-ray of Cu-K $\alpha$  and that Cu-K $\alpha$  is known in the art to have mean wavelength of 1.542 Å, it is reasonable to presume that the X-ray diffraction spectrum disclosed in JP'538 is determined with Cu-K $\alpha$  having a wavelength of 1.542 Å. The burden is on applicants to prove otherwise. Fitzgerald, supra. According to JP'538, the light exposure energy at a wavelength of 780 nm

required to reduce the surface potential of the photoreceptor 15 seconds after charging is  $0.20 \mu\text{J}/\text{cm}^2$ , i.e.,  $2 \text{ erg}/\text{cm}^2$ . See Table 3 at page 29 and the accompanying text. The light exposure energy of  $2 \text{ erg}/\text{cm}^2$  is within the range of "5  $\text{erg}/\text{cm}^2$  or less" recited in instant claims 1, 21, and 22. Accordingly, because the photoreceptor rendered obvious over the combined teachings of Niimi'295 and Hashimoto comprises the Niimi'295 titanyl phthalocyanine crystals that appear to exhibit an X-ray diffraction pattern that is similar to that of JP'538, it is reasonable to presume that the photosensitivity of that photoreceptor would also be similar to that in JP'538. The burden is on applicants to prove otherwise.

Thus, it would have obvious for a person having ordinary skill in the art to minimize, through routine experimentation, the light exposure energy in the image forming apparatus rendered obvious over the combined teachings of Niimi'295, Hashimoto, and Sakai such that the light exposure is within the range of  $5 \text{ erg}/\text{cm}^2$  or less as recited in instant claims 1, 21, and 22. The "motivation" to minimize the light exposure energy is the common technological desire to maximize the efficient use of energy in processes and apparatuses.



10. Claims 1, 5-8, 10, 11, 13-15, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0076633 A1 (Niimi'633), as evidenced by applicants' admission 2, JP'538, and Ladd, combined with Hashimoto and Sakai. See the USPTO translation of JP'538 for cites.

Niimi'633 discloses an image forming apparatus that comprises a photoreceptor **1**, a charger **8**, a light irradiator **10**, an image developer **11**, and a transfer device **15a**, **15b**. Fig. 3 paragraphs 0061 and 0300-0305. Niimi'633 further teaches an image forming apparatus comprising a plurality of image forming units, each comprising a photoreceptor, a charger, a light irradiator, an image developer, a cleaner, and a transfer device. Fig. 7 and paragraphs 0320-0324. Niimi'633 teaches that the charger can be a contact charging system, such as a contact charging roller, as recited in instant claim 11. Paragraph 0302 and Fig. 3, reference label **8**. Because the contact charging roller is in contact with the photoconductor, it meets the charger limitation recited in instant claim 13 that the gap between the charging member and the photoconductor is "200  $\mu\text{m}$  or less." Niimi'633 also teaches that an alternating superimposed voltage can be applied to the charger, which meets the charger limitation recited in instant claim 14. Paragraph 0302.

Niimi'633 exemplifies a photoreceptor comprising an aluminum conductive drum, a charge generation layer, a charge transport layer disposed on the charge generation layer, and a protective layer. See example 28 at pages 32-33. The protective layer comprises particulate alumina having a specific resistivity of  $2.5 \times 10^{12} \Omega \cdot \text{cm}$ , which meets the protective layer limitations recited in instant claims 5 and 6. The charge generation layer comprises titanyl phthalocyanine crystals dispersed in a polyvinylbutyral binder resin. The titanyl phthalocyanine crystals exhibit an X-ray diffraction pattern having a maximum peak at a Bragg angle ( $2\theta \pm 0.2^\circ$ ) of  $27.2^\circ$ , a lowest peak at  $7.3^\circ$ , peaks at  $9.4^\circ$ ,  $9.6^\circ$ , and  $24^\circ$ , no peaks between  $7.3^\circ$  and  $9.4^\circ$ , and no peak at  $26.3^\circ$ . The diffraction pattern is obtained by irradiating the titanyl phthalocyanine with an X-ray of Cu-K $\alpha$  having a wavelength of "1.541 Å."

Paragraph 0151; Fig. 6; and example 28 at pages 32-33. The location of the peaks at angles  $7.3^\circ$ ,  $9.4^\circ$ ,  $9.6^\circ$ , and  $24^\circ$  were determined by interpolating the positions on the x-axis scale in Fig. 6. The X-ray diffraction pattern meets the peak location limitations recited in instant claims 1, 21, and 22.

Niimi'633 further teaches that the charge transport layer can be formed from a non-halogen solvent, such as tetrahydrofuran or dioxane, which meets the solvent limitations

recited in instant claims 7 and 8. Paragraph 0173 and example 1 in paragraphs 0364-0367.

Niimi'633 does not exemplify the use of titanyl phthalocyanine crystals having an average particle diameter as recited in instant claims 1, 21, and 22. However, as discussed supra, the Niimi'633 charge generation layer comprises titanyl phthalocyanine crystals dispersed in a polyvinylbutyral binder resin, where the titanyl phthalocyanine crystals exhibit an X-ray diffraction pattern having a maximum peak at a Bragg angle of  $27.2^{\circ}$ . In addition, Niimi'633 teaches that the charge generation layer is prepared by mixing the charge generation material with a proper solvent and binder resin and dispersing the mixture with "a ball mill . . . to prepare a coating liquid." Paragraphs 0154-0157.

Hashimoto teaches a method of preparing a charge generation dispersion liquid for forming a charge generation layer comprising the step of dispersing a charge generation pigment or dye and a binder resin with a "ball-shaped pulverizing media" in a dispersing solvent to an average particle size of about 0.1 to 0.3  $\mu\text{m}$ , e.g., 0.15  $\mu\text{m}$  or 0.18  $\mu\text{m}$ . The average particle sizes of about 0.1 to 0.3  $\mu\text{m}$ , e.g., 0.15  $\mu\text{m}$  or 0.18  $\mu\text{m}$ , are within the particle diameter limitations of less than 0.3  $\mu\text{m}$  recited in instant claims 1 and 22 and of 0.3  $\mu\text{m}$  or less recited in instant

claim 21. The discussion of Hashimoto in paragraph 9 above is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Niimi'633 and Hashimoto, to prepare a charge generation dispersion coating solution comprising the Niimi'633 titanyl phthalocyanine pigment and polyvinylbutyral resin used in the charge generation layer in example 28 of Niimi'633, as taught by Hashimoto, such that the resultant dispersion solution comprises titanyl phthalocyanine pigment dispersoids having an average particle size of about 0.1 to 0.3  $\mu\text{m}$ , e.g., 0.15  $\mu\text{m}$  or 0.18  $\mu\text{m}$ , and to use the resultant dispersion solution to form the charge generation layer in the photoreceptor disclosed by Niimi'633. That person would have had a reasonable expectation of successfully obtaining an image forming apparatus that has improved stability and excellent photoconductive properties as taught by Hashimoto.

Instant claims 1 and 22 are written in product-by-process format. The combined teachings of Niimi'633 and Hashimoto do not disclose that the charge generation layer is formed by the method recited in the instant claims 1 and 22. However, as discussed above, the combined teachings of Niimi'633 and Hashimoto render obvious a titanyl phthalocyanine pigment having

an average particle size of about 0.1 to 0.3  $\mu\text{m}$ , e.g., 0.15  $\mu\text{m}$  or 0.18  $\mu\text{m}$ . The average particle sizes of 0.15 or 0.18  $\mu\text{m}$  meet the average particle size limitation of less than 0.3  $\mu\text{m}$  recited in instant claims 1 and 22. Thus, it appears that the charge generation layer rendered obvious over the combined teachings of Niimi'633 and Hashimoto is the same or substantially the same as the instantly recited charge generation layer made by the process recited in instant claims 1 and 22. The burden is on applicants to prove otherwise. Marosi, supra; Thorpe, supra; MPEP 2113.

Instant claim 21 is written in product-by-process format. Niimi'633 does not disclose that its titanyl phthalocyanine material is obtained by the method recited in instant claim 21. However, the Niimi'633 titanyl phthalocyanine pigment exhibits an X-ray diffraction spectrum that meets the spectrum recited in instant claim 21. The titanyl phthalocyanine pigment average particle size of 0.15  $\mu\text{m}$  or 0.18  $\mu\text{m}$ , which is rendered obvious over the combined teachings of Niimi'633 and Hashimoto, meets the particle size limitation of 0.3  $\mu\text{m}$  or less recited in instant claim 21. Therefore, it appears that the titanyl phthalocyanine pigment rendered obvious over the combined teachings of Niimi'633 and Hashimoto is the same or substantially the same as the instantly recited titanyl

phthalocyanine crystal made by the process steps recited in the instant claim. The burden is on applicants to prove otherwise. Marosi; Thorpe; MPEP 2113.

Niimi'633 does not disclose that its light irradiator is "configured to irradiate a write light having a resolution of 600 dpi or greater" as recited in the instant claims.

Sakai discloses a multi-beam scanning device to imagewise irradiate the charged photoconductor to form a latent electrostatic latent image. The multi-beam scanning device comprises a semiconductor laser (or laser diode) array **112** and a rotary polygonal mirror **152**. The scanning device provides a writing density of 1200 dpi and the laser beam has a beam spot diameter of 30  $\mu\text{m}$ . The discussion of Sakai in paragraph 9 above is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art to use the Sakai multi-beam scanning device as the light irradiator in the apparatus rendered obvious over the combined teachings of Niimi'633 and Hashimoto. That person would have had a reasonable expectation of successfully obtaining an image forming apparatus that provides good quality reproduced images having a resolution of 1200 dpi.

The cited prior art does not expressly describe an image developer "configured to" develop a latent electrostatic image

formed on the surface of the photoreceptor within 200 msec after the surface of the photoreceptor is exposed by the light irradiator as recited in instant claims 1 and 22. Nor does cited prior art expressly describe a light irradiator "configured to" irradiate a write light on the surface of the photoreceptor with an exposure energy of  $5 \text{ erg/cm}^2$  or less as recited in instant claims 1, 21, and 22.

However, said recitations are merely functional language describing how the apparatus functions. For the reasons discussed supra, the apparatuses and process cartridge rendered obvious over the combined teachings of the prior art meet all of the structural and compositional limitations recited in the instant claims. The functional recitations do not distinguish the structural elements in the instantly claimed apparatus and process cartridge from those in the apparatuses and process cartridge rendered obvious over the cited prior art.

Furthermore, according to the instant specification, the characteristic time in known speedup monochrome electrophotographic apparatuses from a "writing portion," i.e., exposure from the light irradiator in the apparatus, to a "development portion," i.e., development of the latent image with a toner, is "about 200 msec at the longest." See the instant specification, the paragraph bridging pages 3 and 4.

Thus, the time between exposure and development of "within 200 msec" recited in instant claims 1 and 22 appears to be characteristic of the state of the art as of the filing date of the instant application. The instant specification further discloses that in tandem full-color electrophotographic apparatuses, where the photoconductors have a diameter of 30  $\mu\text{m}$  and the copying speed reaches 30 sheets/min or greater, "the time between exposure and development can be set only equal to or less than that of the monochrome electrophotographic apparatus." Page 4, lines 2-10. Thus, a person having ordinary skill in the art would have reasonably expected that the time from exposure to development in speedup image forming apparatuses based on the state of the art, such as those taught by Niimi'633, is at most 200 msec.

Moreover, as discussed above, the combined teachings of Niimi'633 and Hashimoto render obvious a photoreceptor that meets all the structural and compositional limitations recited in the instant claims. Furthermore, example 28 of Niimi'633 uses a laser diode having a wavelength of 780 nm as the light source for image exposure. Niimi'633, paragraph 0491. JP'538 exemplifies a photoreceptor comprising a charge generation layer comprising titanyl phthalocyanine crystals that exhibit an X-ray diffraction pattern that is similar to that of the Niimi'633



titanyl phthalocyanine crystals and that meets the peak locations recited in instant claims 1, 21, and 22. The discussion of JP'538 and Ladd in paragraph 9 are incorporated herein by reference. As discussed in paragraph 9 above, according to JP'538, the light exposure energy at a wavelength of 780 nm required to reduce the surface potential of the photoreceptor 15 seconds after charging is  $0.20 \mu\text{J}/\text{cm}^2$ , i.e.,  $2 \text{ erg}/\text{cm}^2$ . The light exposure energy of  $2 \text{ erg}/\text{cm}^2$  is within the range of " $5 \text{ erg}/\text{cm}^2$  or less" recited in instant claims 1, 21, and 22. Accordingly, because the photoreceptor rendered obvious over the combined teachings of Niimi'633 and JP'337 comprises the Niimi'633 titanyl phthalocyanine crystals that appear to exhibit a X-ray diffraction pattern that is similar to that of JP'538, it is reasonable to presume that the photosensitivity of that photoreceptor would also be similar to that in JP'538. The burden is on applicants to prove otherwise.

Thus, it would have obvious for a person having ordinary skill in the art to minimize, through routine experimentation, the light exposure energy in the image forming apparatus rendered obvious over the combined teachings of Niimi'633, Hashimoto, and Sakai such that the light exposure is within the range of  $5 \text{ erg}/\text{cm}^2$  or less as recited in instant claims 1, 21, and 22. The "motivation" to minimize the light exposure energy

is the common technological desire to maximize the efficient use of energy in processes and apparatuses.

11. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Niimi'633, as evidenced by applicants' admission 2, JP'538, and Ladd, combined with Hashimoto and Sakai, as applied to claim 1 above, further combined with US 2002/0051654 (Niimi'654). See the USPTO translation of JP'538 for cites.

The claim is rejected for the reasons set forth in the office action mailed on Nov. 8, 2007, paragraph 14, which are incorporated herein by reference.

12. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Niimi'633, as evidenced by applicants' admission 2, JP'538, and Ladd, combined with Hashimoto and Sakai, as applied to claim 1 above, further combined with US 6,120,955 (Tokutake). See the USPTO translation of JP'538 for cites.

The claim is rejected for the reasons set forth in the office action mailed on Nov. 8, 2007, paragraph 15, which are incorporated herein by reference.

13. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niimi'633, as evidenced by applicants' admission 2, JP'538, and Ladd, combined with Hashimoto and Sakai, as applied to claim 1 above, further combined with Niimi'654. See the USPTO translation of JP'538 for cites.

The claims are rejected for the reasons discussed in the office action mailed on Mar. 9, 2006, paragraph 26, which are incorporated herein by reference.

14. Applicants' arguments filed on Feb. 26, 2009, as applicable to the prior art rejections set forth in paragraphs 9-13 above, have been fully considered but they are not persuasive.

Applicants assert that their claim for benefit of 35 U.S.C. 119 for the subject matter recited in the instant claims should be granted because the office has not provided any evidence showing that the full scope of the instant claims are not described and fully enabled by the priority document, Japanese Patent Application 2002-263941.

Applicants' assertion is not persuasive. In the office action mailed on Nov. 26, 2008, paragraph 18, pages 35 and 36, the office action cites specific page and line numbers in the verified English-language translation of the priority document filed on Oct. 7, 2008, to show that there is not an adequate

written description as required under 35 U.S.C. 112, first paragraph, of the subject matter recited in the instant claims. It is applicants who have not provided any evidence showing where in the translation, by citing page and line numbers, there is an adequate written description of the subject matter recited in the instant claims.

As discussed in the office action mailed on Nov. 26, 2008, paragraph 18, the examiner has not found where the subject matter recited in the instant claims is described in the translation as set forth under 35 U.S.C. 112, first paragraph, for the following reasons:

(1) The translation does not describe the X-ray diffraction pattern of titanyl phthalocyanine crystals recited in the instant claims 1 and 21. The translation describes "titanyl phthalocyanine crystals having, as a diffraction peak ( $\pm 0.2^\circ$ ) of Bragg angle  $2\theta$  . . . main peaks at  $9.4^\circ$  . . . and a peak at  $7.3^\circ$  as a diffraction peak on the lowest angle side, and not having a peak within a range of from  $7.4^\circ$  to  $9.4^\circ$ ," not the limitation, "from  $7.3^\circ$  to  $9.4^\circ$ " as recited in instant claims 1 and 21. See the translation, claims 1 and 2 at page 3, and paragraph 0019 at page 14. The limitation "not having a peak within a range of from  $7.3^\circ$  to  $9.4^\circ$ " is broader than the translation limitation of

"not having a peak within a range of from 7.4° to 9.4°" because it further excludes peaks between 7.3 to 7.4°.

(2) The translation also does not describe the titanyl phthalocyanine crystals made by the process steps broadly recited in instant claim 21. See the translation, claim 3 at page 3, and paragraphs 0019, 0055, 0056, 0058, 0062, and 0063.

(3) The translation does not describe the apparatus recited in instant claim 21. The translation describes an apparatus where the "photoreceptor takes 200 msec or less to reach from the light exposure means to the developing means." See translation, claim 1 at page 3, and paragraph 0019 at page 14. The apparatus recited in instant claim 21 does not require that the photoreceptor takes 200 msec or less to reach from the light irradiator to the developer as described in the translation.

Thus, for the reasons discussed above, Niimi'295 is not antedated as prior art under 35 U.S.C. 102(a) and 35 U.S.C. 103(c) to the subject matter recited in instant claims 1, 4-15, and 21.

Accordingly, the rejection under 35 U.S.C. 103(a) over Niimi'295 stands.

Applicants assert that neither Niimi'295 nor Niimi'633 is concerned with the problems solved by applicants' invention because the references do not mention the peaks or a lack

thereof within the range of from  $7.3^{\circ}$  to  $9.4^{\circ}$  and at  $26.3^{\circ}$  in the TiOPc crystal X-ray diffraction pattern. Applicants assert that neither Niimi'295 nor Niimi'633 discloses the use of TiOPc crystals having an average particle size as recited in the instant claims. Applicants also assert that Hashimoto does not recognize the unstable crystalline morphology of TiOPc crystals or that said morphology is important for the properties sought by applicants. Applicants further assert that reducing the average particle size of Niimi'295 or Niimi'633 TiOPc crystals by Hashimoto's method of dispersing and ball-pulverizing "reasonably would be expected to alter the crystalline morphology of the TP [titanyl phthalocyanine] crystals during formation from TP crystals having an X-Ray diffraction pattern not having a peak within a range of from  $7.3^{\circ}$  to  $9.4^{\circ}$  and at  $26.3^{\circ}$  to TP crystals having an X-ray diffraction pattern with a peak within a range of from  $7.3^{\circ}$  to  $9.4^{\circ}$  or at  $26.3^{\circ}$ ."

Applicants' assertions are not persuasive for the following reasons:

(1) Although neither Niimi'295 nor Niimi'633 explicitly mentions peak(s) or a lack thereof within the range of from  $7.3^{\circ}$  to  $9.4^{\circ}$  and at  $26.3^{\circ}$  in the TiOPc crystal X-ray diffraction pattern, as discussed in the rejections in paragraphs 9 and 10 above, both Niimi'295 and Niimi'633 clearly teach a charge

generation layer comprising TiOPc crystals that have a X-ray diffraction pattern that meets every peak limitation recited in instant claims 1, 21, and 22, as shown by the X-ray diffraction patterns in Niimi'295 Fig. 8 and in Niimi'633 Fig. 6.

(2) The reasons for combining the references do not have to be those of applicants. For the reasons discussed in paragraphs 9 and 10, supra, Hashimoto provides reason, suggestion, and motivation to use the method taught by Hashimoto to make a charge generation dispersion liquid comprising charge generation material particles having an average particle size that is within the TiOPc average particle size ranges recited in instant claims 1, 21, and 22.

(3) Contrary to applicants' assertion, none of the references suggests dispersing and ball-pulverizing the TiOPc during formation of the TiOPc crystals. Rather, as discussed in paragraphs 9 and 10, supra, both Niimi'295 and Niimi'633 teach that their respective charge generation layers are prepared by using a charge generation dispersion formed by dispersing with a ball mill the TiOPc crystals with a proper solvent and binder resin. As discussed in the paragraphs 9 and 10, Hashimoto teaches forming a charge generation dispersion by dispersing a charge generation pigment and a binder resin with a "ball-shaped pulverizing media" in a dispersing solvent, such that the

resultant dispersion comprises charge generation particles having an average particle size of 0.15 or 0.18  $\mu\text{m}$ . The Hashimoto method for making a charge generation dispersion appears to be the same or similar to that exemplified in the Photoconductor Manufacturing Example 1 of the specification. See Photoconductor Manufacturing Example 1 at page 94, lines 3-12, of the instant specification, which describes dispersing the TiOPc pigment in Synthesis Example 1, a binder resin, and a solvent in "a commercially available beads mill dispersing machine," where the resulting dispersion comprises TiOPc crystals having an average particle size of 0.25  $\mu\text{m}$ . As discussed infra, the instant specification does not report the average particle size of the TiOPc crystals made in Synthesis Example 1. Rather, the instant specification reports the average particle of the TiOPc crystals only after the crystals are dispersed by ball-milling a mixture of the crystals and binder resin in a solvent. The instant specification does not disclose that dispersing by ball-milling TiOPc crystals and a binder resin in a solvent changes the crystal morphology of the TiOPc.

Thus, it appears that the charge generation layers rendered obvious over the combined teachings of Niimi'295 and Hashimoto or over the combined teachings of Niimi'633 and Hashimoto are



the same or substantially the same as the instantly recited charge generation layer made by the process in the product-by-process limitations recited in instant claims 1, 21, and 22.

(4) Moreover, the showing in the instant specification is insufficient to show that the charge generation layer generation layer made by the process steps recited in instant claims 1, 21, and 22 is not the same as that the charge generation layers rendered obvious over the combined teachings of the cited prior art for the following reasons:

First, contrary to applicants' assertion, the description in Synthesis Example 1 at pages 84-85 and in Table 1 and in Synthesis Example 2 at pages 90-92 does not describe filtering the TiOPc crystals "to a particular size." Rather, the instant specification describes collecting the precipitates of various forms of the TiOPc by filtering, i.e., removing a liquid. For example, Synthesis Example 1 describes at page 84, lines 16-17, that "a precipitate [of the crude TiOPc] was collected by filtration"; at page 84, lines 24-25, that the "crystals [of TiOPc] thus precipitated were collected by filtration . . ."; and at page 85, lines 5-6, that the "reaction mixture [which comprises the solvent tetrahydrofuran] was filtered and dried, whereby titanyl phthalocyanine crystals to be used . . . were obtained." Also see Synthesis Example 8 for similar disclosure

at page 91, lines 1-2, 9-10, 12-13, and 23-24. Neither the description in Synthesis Examples 1 and 8 nor in Table 1 reports the average particle size of the TiOPc crystals made in Synthesis Examples 1 and 8. Rather, as noted in item (3) above, the dispersing and ball-milling of the charge generation materials in a solvent described in Photoconductor Manufacturing Example 1 forms TiOPc crystals having an average particle size as recited in the instant claims. In addition, Photoconductor Manufacturing Example 1 is not within the process recited in the product-by-process limitations recited in instant claims 1, 21, and 22. The description in Manufacturing Example 1 does not mention filtering the resultant dispersion as recited in instant claims 1 and 22. Nor does the description disclose that the TiOPc crystals are made by the process recited in instant claim 21.

Second, the showings in Synthesis Examples 2-7 and 9 are not probative comparisons to either Niimi'295 or Niimi'633 because the none of the TiOPc crystals obtained in those examples exhibits an X-ray diffraction pattern as shown in Niimi'295 Fig. 8 or in Niimi'633 Fig. 6. Nor do they exhibit the X-ray diffraction pattern recited in instant claims 1, 21, and 22, as noted by applicants. See Table 1 and Figures 10-12 of the instant specification. None of the references,

Niimi'295, Niimi'633, and Hashimoto, teaches or suggests dispersing by ball-milling the precursor of a charge generation material to form charge generation material particles having a particular particle size. Rather, as discussed in item (3) above, the references teach dispersing by ball-milling the components used to form the charge generation layer.

Third, neither the description in Synthesis Examples 2 to 7 nor in Table 1 report the average particle size of the TiOPc crystals made in those examples. Rather, the instant specification reports the average particle size of the TiOPc crystals dispersed in a solvent after forming a charge generation dispersion by a ball-milling method. In Photoconductor Manufacturing Examples 2 to 7 in the instant specification, the respective charge generation dispersions are said to be made by a similar method as described in Photoconductor Manufacturing Example 1, but for the use of the particular TiOPc crystals. Photoconductor Manufacturing Examples 2 to 7 use the TiOPc crystals obtained in Synthesis Examples 2 to 7, respectively. The resultant dispersions in Photoconductor Manufacturing Examples 2 to 7 are said to comprise TiOPc crystals having average particle sizes of 0.26, 0.30, 0.28, 0.24, 0.27, and 0.24  $\mu\text{m}$ , respectively. See the instant specification, page 95, line 1, to page 96, line 3. All

of the TiOPc crystals have average particle sizes within the TiOPc particle size range recited in instant claim 21. All but one of the TiOPc crystals have average particle sizes within the particle size range recited in instant claims 1 and 22. There is no disclosure in the instant specification that the crystal morphology of the various TiOPc crystals in the resultant charge generation dispersions were altered by the ball-milling dispersing method. As discussed above, none of the TiOPc crystals in Synthesis Examples 2-7 exhibit the diffraction pattern recited in instant claims 1, 21, and 22. Nor do they exhibit an X-ray diffraction pattern as taught by Niimi'295 or Niimi'633.

Accordingly, the showing in the instant specification is not a probative comparison to either Niimi'295 or to Niimi'633. Nor is the showing sufficient to show that combined teachings of Hashimoto with either Niimi'295 or Niimi'633 would have made a charge generation layer comprising TiOPc crystals that differs substantially from that made by the process recited in the product-by-limitations recited in instant claims 1, 21, and 22. Applicants have not met their burden to show that the charge generation layers rendered obvious over the combined teachings of the cited prior art are not the same or substantially the same as the charge generation layer made by the process recited

in the product-by-process limitations recited in instant claims 1, 21, and 22.

The rejections in paragraphs 9-13 stand.

15. Claims 1, 4-15, 21, and 22 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 7-23, 28, 33, 34, 36, 37, and 39 of copending US application 10/606,750 (Application'750), as evidenced by applicants' admission 2, JP'538, and Ladd, in view of Sakai. See the USPTO translation of JP'538 for cites. (The rejection is based on the claims in Application'750 filed on Dec. 10, 2008. However, the reasons for rejection have not changed from those set forth in the office action mailed on Nov. 26, 2008, paragraph 19.)

The claims are rejected for the reasons set forth in the office action mailed on Nov. 26, 2008, paragraph 19, which are incorporated herein by reference.

Applicants' arguments filed on Feb. 26, 2009, have been fully considered but they are not persuasive.

Applicants assert that "[a]lthough the present application is not the earlier filed application, if the claims in this application are otherwise in condition for allowance before the claims in 10/606,750 are in condition for allowance, the

obviousness-type double patenting rejection may and should be withdrawn."

Applicants' assertion is not persuasive. First, the provisional rejection is not the only issue in the instant application. Furthermore, MPEP 804 subsection I.B.1 states "[i]f the [provisional] ODP rejection [nonstatutory obviousness-type double patenting rejection] is the only rejection remaining in the latter-filed application, while the earlier filed application is rejectable on other grounds, a terminal disclaimer must be required in the latter-filed application before the rejection is withdrawn" (emphasis added). The instant application is the latter-filed application. Thus, even if the provisional obviousness-type double patenting rejection were the only remaining rejection in the instant application, a terminal disclaimer to Application'750 will be required before the rejection is withdrawn.

Accordingly, the rejection stands.

16. Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 1795

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (571) 272-1382. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Mark Huff, can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry regarding papers not received regarding this communication or earlier communications should be directed to Supervisory Application Examiner Ms. Sandra Sewell, whose telephone number is (571) 272-1047.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Janis L. Dote/  
Primary Examiner, Art Unit 1795

JLD

Jun. 21, 2009